Comments

EPA HQ – None.

EPA Region – None.

State -

From:	"Brian Queen" <brian.queen@epa.state.oh.us>
To:	James Kohler/DC/USEPA/US@EPA
Cc:	"Craig Butler" <Craig.Butler@epa.state.oh.us>, "Dan Harris" <dan.harris@epa.state.oh.us>, "Dave Chenault" <dave.chenault@epa.state.oh.us>, "Dave Schuetz" <dave.schuetz@epa.state.oh.us>, "George Elmaraghy" <George.Elmaraghy@epa.state.oh.us>, "Jeff Hines" <Jeff.Hines@epa.state.oh.us>, "Jim Sferra" <jim.sferra@epa.state.oh.us>, "Jim Simpson" <Jim.Simpson@epa.state.oh.us>, "Jon Bernstein" <Jon.Bernstein@epa.state.oh.us>, "Pam Allen" <pam.allen@epa.state.oh.us>, "Paul Novak" <Paul.Novak@epa.state.oh.us>, "Rich Fox" <rich.fox@epa.state.oh.us>
Date:	01/05/2010 10:41 AM
Subject:	Draft Coal Ash Impoundment Assessment Reports

Dear Mr. Kohler

Thank you for providing Ohio EPA the opportunity to review the Draft Coal Ash Impoundment Assessment Reports. We appreciate you keeping us involved in this process. If US EPA decides to issue press releases for these facilities we would appreciate seeing them before they're released as you did for AEP Philip Sporn.

The reports' descriptions of the facilities field evaluations and the assessments of the loading conditions appear to be accurate for all six facilities and we have no comments at this time.

Thanks

Brian Queen
(740) 380-5420
brian.queen@epa.state.oh.us

Also: See letter dated January 28, 2010 (comments from Ohio State Dam Safety Engineering Program).

Company – See attached letter dated January 28, 2010.

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR SEAN D. LOGAN, DIRECTOR

David Hanselmann • Chief

Division of Soil & Water Resources

January 28, 2010

Jim Kohler, P.E.
Environmental Engineer
LT, U.S. Public Health Service
U.S. Environmental Protection Agency
Office of Resource Conservation and Recovery
(Letter provided by email)

RE: Assessment of Dam Safety Coal Combustion Surface Impoundments Draft Reports for Conesville Generation Station, Muskingum River Power Plant, JM Stuart Station, W.C. Beckjord Station, Miami Fort Generating Station, and Kyger Creek Power Station

Dear Mr. Kohler:

Thank you for the opportunity to join Clough, Harbour, & Associates (CHA) on their inspections of the dams at the power stations referenced above and to provide comments on the draft report. The reports were very thorough in the areas of dam safety that were reviewed. Although some typographical errors were noted, they have not been listed in this letter and it is expected that they will be recognized and corrected during CHA's final revisions to the reports. The comments provided below are in reference to more general concepts for the evaluations.

Hydrologic and Hydraulic Design – General

Section 3.2 of each report provides an evaluation of hydrologic and hydraulic design of each impoundment. The reports refer to Ohio Administrative Code (OAC) Rules for design flood and freeboard. The Dam Safety Engineering Program interprets these rules as follows. For a Class II upground reservoir with at least half of its impoundment as open water, the structure can inherently store the 50% probable maximum flood, and the appropriate evaluation considers overfilling prevention (OAC Rule 1501:21-13-03) and available freeboard (OAC Rule 1501:21-13-07). Also, the required freeboard is not added to pool elevation during the design flood – it is based on the maximum operating level.

> *1501:21-13-03 (D) Every upground reservoir shall have an overflow or other device to preclude overfilling the reservoir during normal filling operations. Local watershed drainage into the reservoir must also be included in the design of the overflow device if applicable.*
>
> *1501:21-13-07 Sufficient freeboard shall be provided to prevent overtopping of the top of the dam due to passage of the design flood and other factors including, but not limited to, ice and wave action. The chief may approve a lower freeboard requirement if the dam is armored against overtopping erosion.*

(A) For class I and class II dams that are upground reservoirs, the minimum elevation of the top of the dam shall be at least five feet higher than the elevation of the designed maximum operating pool level unless otherwise approved by the chief.

Structural Stability and Adequacy - General

Section 3.3 of each report provides an evaluation of structural stability and adequacy. The reports refer to Table 3-1 of the US Army Corps of Engineer's Engineering Manual 1110-2-1902. A copy of a portion of this section from the Miami Fort Generating Station report has been included for reference as well as a copy of Table 3-1 from the manual.

In performing a review of the structural adequacy and stability of Ash Pond A and Ash Pond B, CHA has compared the computed factor of safety provided in the original design documents for the ash ponds with minimum required factors of safety as outlined by the U.S. Army Corps of Engineers in EM 1110-2-1902, Table 3-1. The guidance values for minimum factor of safety are provided in Table 3.

Table 4 - Minimum Safety Factors Required

Load Case	Required Minimum Factor of Safety
Steady State Conditions at Present Pool or Maximum Storage Pool Elevation	1.5
Rapid Draw-Down Conditions from Present Pool Elevation	1.3
Maximum Surcharge Pool (Flood) Condition	1.4
Seismic Conditions from Present Pool Elevation	1.0
Liquefaction	1.3

From the Miami Fort Generating Station report

EM 1110-2-1902
31 Oct 03

Table 3-1
Minimum Required Factors of Safety: New Earth and Rock-Fill Dams

Analysis Condition[1]	Required Minimum Factor of Safety	Slope
End-of-Construction (including staged construction)[2]	1.3	Upstream and Downstream
Long-term (Steady seepage, maximum storage pool, spillway crest or top of gates)	1.5	Downstream
Maximum surcharge pool[3]	1.4	Downstream
Rapid drawdown	1.1-1.3[4,5]	Upstream

[1] For earthquake loading, see ER 1110-2-1806 for guidance. An Engineer Circular, "Dynamic Analysis of Embankment Dams," is still in preparation.
[2] For embankments over 50 feet high on soft foundations and for embankments that will be subjected to pool loading during construction, a higher minimum end-of-construction factor of safety may be appropriate.
[3] Pool thrust from maximum surcharge level. Pore pressures are usually taken as those developed under steady-state seepage at maximum storage pool. However, for pervious foundations with no positive cutoff steady-state seepage may develop under maximum surcharge pool.
[4] Factor of safety (FS) to be used with improved method of analysis described in Appendix G.
[5] FS = 1.1 applies to drawdown from maximum surcharge pool; FS = 1.3 applies to drawdown from maximum storage pool.
For dams used in pump storage schemes or similar applications where rapid drawdown is a routine operating condition, higher factors of safety, e.g., 1.4-1.5, are appropriate. If consequences of an upstream failure are great, such as blockage of the outlet works resulting in a potential catastrophic failure, higher factors of safety should be considered.

From the Engineering Manual

The analysis condition for end-of-construction has been eliminated from the tables in CHA reports, which is appropriate considering the age of these structures. However, CHA has included analysis conditions for seismic and liquefaction, which are not specifically addressed in Table 3-1. Table 3-1 does refer to ER 1110-2-1806; this document provides guidance but does not note specific factors of safety. The appropriate references for these factors of safety should

be noted. In addition, it is important to note that the table is intended for new construction, and the manual provides allowances for reducing the factors of safety for dams that have been in operation for long periods of time.

> c. *Factors of safety.* Acceptable values of factors of safety for existing dams may be less than those for design of new dams, considering the benefits of being able to observe the actual performance of the embankment over a period of time. In selecting appropriate factors of safety for existing dam slopes, the considerations discussed in Section 3-1 should be taken into account. The factor of safety required will have an effect on determining whether or not remediation of the dam slope is necessary. Reliability analysis techniques can be used to provide additional insight into appropriate factors of safety and the necessity for remediation.

In particular, the slope stability analysis for the Muskingum River Units 1-4 Bottom Ash Pond included four scenarios that have factors of safety below 1.5 but above 1.42. Considering the age of the structure, the current and historic operation of the impoundment as a pumped-storage facility with a static pool, and the location of the failure planes with respect to releasing the impoundment, further discussion for considering these factors of safety acceptable should be provided.

Muskingum River Power Plant Report

Section 4.2 should include monitoring the seeps at the downstream toe of Muskingum River Lower Fly Ash Dam.

W.C. Beckjord Station

According to the as-built plans for Beckjord Ash Pond C Extension Dam and field investigtion, the 30-inch-diameter concrete pipe that connects to Ash Pond C has not been plugged. However, the overflow pipe in the southwest corner that consists of a 54-inch-diameter CMP riser and 36-inch-diameter Corban reinforced fiberglass pressure pipe has been plugged with concrete.

Table 2 should be corrected to include a normal pool elevation of 518.0 for Beckjord Ash Pond C Extension Dam.

The Division of Soil & Water Resources looks forward to continuing cooperation with US Environmental Protection Agency in investigating and improving the conditions of coal ash impoundments. Please contact me at 614/265-6738 if you have any questions.

Sincerely,

Keith R. Banachowski, P.E.
Program Manager
Dam Safety Engineering Program
Division of Soil & Water Resources

CORPORATE EHS SERVICES

Duke Energy Corporation
526 South Church St.
Charlotte, NC 28202

Mailing Address:
EC13K / PO Box 1006
Charlotte, NC 28201-1006

Via E-Mail and Overnight Courier

January 28, 2010

Mr. Stephen Hoffman
US Environmental Protection Agency
Two Potomac Yard
2733 S. Crystal Drive
5th Floor, N-237
Arlington, VA 22202-2733

RE: US EPA Request/ICR # 2350.01
Miami Fort Station
11021 Brower Road
North Bend, Ohio 45052

Dear Mr. Hoffman:

Duke Energy Ohio, Inc. (DEO) received and has reviewed the draft report for Miami Fort Station that resulted from the site assessment of Ash Basins A and B conducted by the United States Environmental Protection Agency (EPA) and its engineering contractors on October 6-7, 2009. Duke Energy supports the EPA's objective to ensure ash basin dam safety. We remain committed to operating and maintaining all of our coal ash basin dams safely.

The impoundment facilities at Miami Fort are currently under the regulatory authority of the Ohio Department of Natural Resources, Division of Water (ODNR). The ODNR conducts an assessment/inspection of the impoundments at a minimum of once every five years. Duke Energy also plans to continue a rigorous internal inspection program.

Duke Energy remains committed to meeting all state and federal requirements and to managing its coal combustion byproducts impoundments in a very safe and responsible manner. Duke is confident, based on ongoing monitoring, maintenance and inspections, that each of Duke's ash basin dams has the structural integrity necessary to protect the public and the environment.

Duke Energy submits the following comments regarding the draft report:

Section 1.1, Page 1

1. Paragraph 3, second sentence: replace sentence with:
   "Bottom ash, pyrites, water soluble limestone impurities, and fly ash are sluiced to Ash Pond A and miscellaneous yard drainage is currently discharged directly to Ash Pond A & B"

2. Paragraph 3, second sentence strike sentence:
   As shown in photo No. 2.

3. Paragraph 3, third sentence strike words: "units 1 and 2 (on line since 1926)"

4. Paragraph 3, third sentence change "(1978-1979)" in parenthesis to "(1975 and 1977)".

5. Paragraph 3, fifth sentence, replace sentence with:
   "Fly ash is also exported by rail and truck."

6. Footer, replace with:
   Draft Report
   Assessment of Dam Safety of
   Coal Combustion Surface Impoundments
   Duke Energy Corporation
   Miami Fort Electric Generating Station
   North Bend, OH

   (The footer problem occurs again on pages 23 and 56)

7. **Section 1.1, Page 2**

Paragraph 5, spelling correction under "Name" column. Two names are spelled incorrectly. Below is the correct spelling.

Wayne Theobald
Jim Stieritz

8. **Section 1.2.1.1, Page 3**

The Table 1 Ash Pond NPDES Discharge Location identified as Outfall No. "006" should be identified as "608" instead.

9. Section 1.3.1, Page 4

In paragraph two, the first sentence should be replaced with: "The ash ponds receive fly ash, bottom ash, pyrite, and yard drainage."

Section 1.3.5, Page 8

10. In the first sentence of paragraph two, replace with: "Solid materials collected in Ash Pond A are generally reclaimed for beneficial reuse or landfill placement."

11. Replace the fourth sentence in paragraph three with: "The diversion barrier (Photo No. 8) is used to redirect flow to increase residence time in Ash Pond B."

12. Section 2.2.6, Page 27

In the fifth sentence of paragraph one, replace the word "four" with "three".

13. Photo 7, Page 35

Replace photo title with: "Culvert on northern side of interior diversion barrier in Ash Dike B."

14. Photo 8, Page 35

Replace photo title with: "Diversion barrier in Ash Pond B. Feature not shown on plans."

15. Photo 15, Page 39

Replace photo title with: "Beaching erosion due to wave action."

Note: The circular feature seen in the photo looks like a culvert, but it is a drum. This is correctly called "beaching erosion in Section 2.2.5, page 26, first paragraph, last sentence: "beaching erosion due to wave action noted (Photo No. 15)"

16. **Section 3.3, Page 58**

The "Minimum Safety factors Required" for slope stability as presented in Table 3 of the report is taken from Table 3-1 of the U.S. Army Corps of Engineers publication EM-1110-2-1902, dated October 31, 2003. This manual expressly states that the values in Table 3-1 apply to the design of new earth and rock-fill dams. With regard to existing dams, Section 3-3c of this manual states:

> *Acceptable values of factors of safety for existing dams may be less than those for design of new dams, considering the benefits of being able to observe the actual performance of the embankment over a period of time.*

Ash Pond A, has been in service for 50 years (over 30 years since its vertical expansion), and Pond B has been in service over 28 years. Based on the U.S. Corps of Engineer requirements cited above and the observed performance history of the ponds, Duke Energy believes that lower factors of safety would be applicable.

17. Section 3.5, Page 64

Replace the third sentence in paragraph two with: "Beginning in 2009, Quarterly Ash Pond Inspections have been performed and documented by a Duke Professional Engineer."
Note: Duke is asking that this sentence be replaced because the sentence incorrectly states that "...this is the only inspection report prepared for the facility by a professional engineer." Four inspections a year are performed and documented by a Duke Professional Engineer.

If you have any questions regarding these comments or need additional information, please contact me at 980-373-3719.

Sincerely,

D. Edwin M. Sullivan

D. Edwin M. Sullivan, PE
Environmental Health & Safety